1   1.   (Amended) A customer profiling apparatus for conducting
2   customer telephone behavior pattern analysis on telephone call records including
3   telephone call data, comprising:
4   processing circuitry operative to process customer telephone call
5   records;
6   a data warehouse coupled with the processing circuitry and configured
7   to store the processed customer telephone call records;
8   an OnLine Analytical Processing (OLAP) based scalable profiling
9   engine communicating with the data warehouse and operative to build and update
10   customer behavior profiles by mining the customer telephone call records that flow
11   into the data warehouse; and
12   at least one computer program, performed by the profiling engine, and
13   operative to define behavior profiles, using data from the telephone call records, as
14   data cubes and derive similarity measures on patterns extracted from the behavior
15   profiles.

         Cancel claim 2.

1   3.   The apparatus of claim 1 wherein the profiling engine
2   comprises a commercial data warehouse server and a multi-dimensional OLAP
3   server.

1   4.   The apparatus of claim 1 wherein the profiling engine
2   implements multi-level, multi-dimensional pattern analysis and comparison.

1   5.   The apparatus of claim 1 wherein the behavior profiles are
2   defined at least in part by probability distributions.

1   6.   The apparatus of claim 1 wherein similarity measures are
2   defined and computed on the patterns extracted from the behavior profiles.

1   7.   The apparatus of claim 1 wherein the computer program is
2   further operative to compare the data cubes with similarity measures identifying fraud
3   so as to extract fraud detection from the behavior profiles.

                                                        S/N: 09/464,311
                                                        Case: 10991149-1
                                                        Amendment B

Cancel claim 8.

1   9.   (Amended) The apparatus of claim 1 wherein the behavior
2 profiles are analyzed to detect caller fraud.

1   10.   The apparatus of claim 1 wherein the customer records
2 comprise customer call records, the profiling engine builds and updates customer
3 calling behavior profiles by mining the customer call records, and the computer
4 program derives similarity measures on patterns extracted from the call behavior
5 profiles.

1   11.   (Amended) A profiling apparatus, comprising:
2   a data warehouse for storing customer records including telephone call
3 data;
4   a profiling engine configured to communicate with the data warehouse
5 and operative to generate customer telephone calling behavior profiles from the
6 customer records within the data warehouse, the profiling engine being configured to
7 define customer telephone calling behavior profiles using probability distributions,
8 and to compute the customer telephone calling behavior profiles using OLAP
9 operations on multi-dimensional and multi-level data cubes, one multi-level data cube
10 being a profile cube, another multi-level data cube being a profile-snapshot cube,
11 and yet another data cube being a profile cube formed by merging together the
12 profile cube and the profile-snapshot cube; and
13   a computer application program implemented on the profiling engine
14 and operative to represent behavior profiles as patterns, using the telephone call
15 data, and derive similarity measures of the patterns usable to profile customer
16 behavior and detect fraud.

Cancel claims 12-15.

1   16.   (Amended) The apparatus of claim 11 wherein the updated
2 profile cube is stored within a profile table of the data warehouse such that
3 subsequent customer profiling utilizes customer records from the data warehouse
4 comprising the updated profile cube.

1   17.   A method for comparing customer behavior patterns,
2 comprising:
3   providing call data in the form of call data records to a data warehouse;
4   loading the call data records into an OLAP server;
5   generating a profile-snapshot cube accommodating multiple
6 customers;
7   in combination with generating the profile-snapshot cube, generating a
8 profile cube for the same set of customers from the data warehouse;
9   updating the profile cube by merging the profile cube with the profile-
10 snapshot cube; and
11   storing the updated profile cube in the data warehouse.

1   18.   The method of claim 17 wherein the data warehouse comprises
2 profile tables configured to store the profile cube.

1   19.   The method of claim 17 wherein the updated profile cube is
2 subdivided into a plurality of individual calling pattern cubes, each representative of
3 individual customers.

1   20.   The method of claim 19 further comprising the step of
2 performing at least one of reporting, analyzing, and visualizing of one of the calling
3 pattern cubes for an individual customer.